

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (Currently Amended) A device for separating at least one compound from a mixture by adsorption with a simulated moving bed, comprising at least:

an enclosure or column comprising adsorbent beds (A_i), at least two adsorbent beds being separated by at least one fluid distribution and extraction plate (P_i), the plate comprising one or more panels allowing distribution, mixing and/or extraction of fluids, at least one panel comprising a single distribution, mixing and/or extraction chamber (C_i),

a plurality of lines ($10, 11, 12, 13, T_i$) for extraction or injection of secondary fluids,

a bypass circuit communicating a distribution plate with at least one bypass line ($L_{i,j}$), wherein

the device comprises means ($14, V_{oi,j}, 20$) for communicating said at least one single distribution, mixing and/or extraction chamber (C_i) with at least one bypass line ($L_{i,j}$),

at least one end of said at least one bypass line communicates with a zone (R_i, R'_i) of an adsorbent bed, said zone being distinct from any distribution chamber ~~chambers~~ (C_i), and another end of said at least one bypass line is connected to a chamber (C_i).

Claim 2 (Currently Amended) A device as claimed in claim 1, wherein ~~characterized in that~~ said means for communicating (C_i) with ($L_{i,j}$) comprises at least one valve ($V_{oi,j}$) arranged on at least one bypass line ($L_{i,j}$) and in that an end of the bypass line that is not connected to the zone of the adsorbent bed is connected to a delivery and/or extraction line (T_i), which line (T_i) is connected to chamber (C_i).

Claim 3 (Currently Amended) A device as claimed in claim 1, wherein

~~characterized in that~~ said means for communicating (Ci) with (Li,j) comprises at least one rotary valve (20), said rotary valve being connected to at least one delivery and/or extraction line (Ti) and to at least one bypass line (Li,j), said valve comprising means allowing at least to communicate a delivery and/or extraction line with at least one bypass line.

Claim 4 (Currently Amended) A device as claimed in claim 3, wherein ~~characterized in that~~ said rotary valve (20) is in communication with a plurality of groups of lines, group G₁, group G₂ and group G₃, said valve comprising:

- a stator (110) provided with several means (E, F, R, S) for circulation of a fluid(s) of a group G₁, means (115, 116) allowing passage of at least two fluids F₁, F₂ belonging to group G₃, said means (115, 116) comprising a substantially equal number of passages, means (115) having a flow section S₁, means (116), having a flow section S₂, different from S₁,
- a rotor (117) equipped with means (119) for passage of fluids of a group G₃ and means (120) for communication of either the fluids of group G₁ with group G₃, or of group G₃ with group G₃, and
- means (122) for communicating at least two fluids of group G₃.

Claim 5 (Previously Presented) A device as claimed in claim 4, wherein the means for passage of fluid F₁ and of fluid F₂ have flow sections S₁ and S₂ respectively, wherein S₁/S₂ ratio is 2 to 10.

Claim 6 (Previously Presented) A device as claimed in claim 4, said means communication of fluids of group G₃ consists of slots (122) provided in a layer of material or liner deposited on the lower face of the rotor.

Claim 7 (Currently Amended) A device as claimed in claim 6, wherein ~~characterized in that~~ a slot (122) has a depth at least equal to the thickness of the liner.

Claim 8 (Previously Presented) A device as claimed in claim 6, wherein said

circulation means (E, R, S, F) comprises a plurality of grooves arranged on an upper face of the stator and slots (122) are provided in the liner.

Claim 9 (Previously Presented) A device as claimed in claim 4, wherein circulation means (E, R, S, F) are 4 in number.

Claim 10 (Previously Presented) A device as claimed in claim 1, wherein said enclosure comprises a non-perforated central tube over at least part of the length thereof, and in the panels forming a plate comprise a tangential cutout; and wherein zone (R_i, R'_i) comprises at least one diverted fluid distribution means (53, 54), and the end of bypass line (L_{i,j}) connected to chamber (C_i) opens into said diverted fluid distribution means (53, 54).

Claim 11 (Previously Presented) A device as claimed in claim 10, wherein a fluid distribution circuit is arranged around said enclosure and comprises a main line (61) divided into a plurality of secondary lines (62, 63, 62a, 62b) so that the fluid(s) reach the panels forming a plate substantially at the same time.

Claim 12 (Previously Presented) A device as claimed in claim 10, wherein the plates form a parallel cutout and in that the fluid distribution circuit comprises a main line, and a bypass line connected to an adsorbent bed by means of a device comprising transfer ports.

Claim 13 (Previously Presented) A device as claimed in claim 1, wherein a plate is delimited by a lower grid (6) and an upper grid (7) and in that an end of the bypass line connected to the adsorbent bed is connected to a distribution means (30) arranged above said upper grid.

Claim 14 (Previously Presented) A device as claimed in claim 1, wherein a plate comprises a plurality of panels forming a radial cutout, the enclosure comprises a central tube and a secondary fluid distribution ring in communication with a distribution plate, and a diverted

fluid distribution means, said means being arranged below the distribution ring and said means being connected to the end of the bypass line, said bypass line being connected to a zone of an adsorbent bed.

Claim 15 (Previously Presented) A device as claimed in claim 14, wherein said diverted fluid distribution means comprise at least one diverted fluid distribution ring (53), said ring (53) being arranged in a perforated means (55), said means having a substantially conical shape.

Claim 16 (Previously Presented) A device as claimed in claim 10, wherein said perforated means comprises a wall (55) forming an angle α with the central tube and in that said ring (53) is located at a distance a from said grid.

Claim 17 (Previously Presented) A device as claimed in claim 1, wherein said column comprises a substantially central mast comprising one or more mast elements (80), including at least:

- an upper part (81),
- A distributor-collector part (82) comprising one or more secondary ports (86i) and at least one main port (85), the flow sections of ports (85) and (86i) being different,
- a lower part (83)
- a distributor-collector part(s) (82) are arranged between an upper part (81) and a lower part (83)
- a sealing element (84a) arranged between distributor-collector part (82) and lower part (83),
- a separation element (87) arranged on distributor-collector part (82), thus delimiting two fluid circulation spaces (82a, 82b).

Claim 18 (Currently Amended) In a process comprising injection of a diverted fluid in a simulated moving bed separation process, comprising at least the following stages:
circulating a main fluid through a plurality of adsorbent beds in an enclosure,
injecting and extracting secondary fluids comprising feed, desorbent, extract and/or raffinate according to a sequential order to achieve separation of the constituents of the feed,
injecting a diverted fluid,
the improvement wherein at least part of the main fluid is circulated outside the enclosure allowing separation by means of a bypass line comprising at least two ends, one end being connected to a zone of an adsorbent bed distinct from distribution chambers (C_i) , so as to inject and/or to extract part of the main fluid in the zone.

Claim 19 (Canceled)

Claim 20 (Currently Amended) A process as claimed in claim 18, wherein a fraction of the main fluid is drawn off from a zone of an adsorbent bed A_i and said fraction is injected into a chamber C_i .

Claim 21 (Previously Presented) A process as claimed in claim 18, wherein paraxylene is separated from aromatic hydrocarbon-containing feeds with eight carbon atoms.

Claim 22 (Previously Presented) A device according to claim 5, wherein the S_1/S_2 ratio is about 4.

Claim 23 (Canceled)

Claim 24 (Previously Presented) A device according to claim 1, comprising at least one bypass line $L_{i,j}$ with $j=i+1$, in which a fluid is diverted from a chamber (C_i) to a zone (R_{i+1}) .

Claim 25 (Previously Presented) A process as claimed in claim 18, wherein a fraction of the main fluid is drawn off from a chamber (C_i) corresponding to a plate P_i and the main fluid fraction drawn off is injected into a zone of adsorbent bed A_{i+1} .

Claim 26 (New) A device for separating at least one compound from a mixture by adsorption with a simulated moving bed, comprising at least:

an enclosure or column comprising adsorbent beds (A_i), at least two adsorbent beds being separated by at least one fluid distribution and extraction plate (P_i), the plate comprising one or more panels allowing distribution, mixing and/or extraction of fluids, each panel comprising a single distribution, mixing and/or extraction chamber (C_i),

a plurality of lines (10, 11, 12, 13, T_i) for extraction or injection of secondary fluids,

a bypass circuit communicating a distribution plate with at least one bypass line ($L_{i,j}$), wherein

the device comprises means (14, $V_{oi,j}$, 20) for communicating said at least one single distribution, mixing and/or extraction chamber (C_i) with at least one bypass line ($L_{i,j}$),

at least one end of said at least one bypass line communicates with a zone (R_i , R'_i) of an adsorbent bed, said zone being distinct from any distribution chamber, and another end of said at least one bypass line is connected to chamber (C_i).